

Excel 3 Homework #1

- Use the **average**, **standard deviation**, **min**, and **max**, functions from the Excel Function Library on the Birth and Death Columns of Excel 1.
- The result of each function should begin a new row in the table.

Number of Births and Deaths in the United States

Year	Births	Deaths
1976	3,167,788	1,909,440
1980	3,612,258	1,989,841
1982	3,680,537	1,974,797
1984	3,669,141	2,039,369
1986	3,756,547	2,105,361
1988	3,909,510	2,167,999
1990	4,158,212	2,148,463
1991	4,110,907	2,169,518
1992	4,065,014	2,175,613
1993	4,000,240	2,268,553
1994	3,952,767	2,278,994

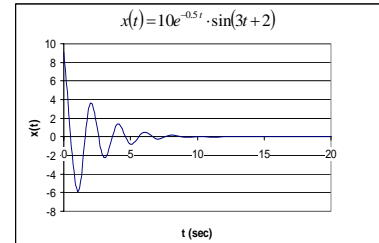
Excel 3 Homework #2

Create an Excel worksheet to plot the following function over the range $0 \leq t \leq 20$ seconds as a scatter plot at 1 second intervals.

$$x(t) = 10e^{-0.5t} \cdot \sin(3t + 2)$$

*Expected result is given to the right

•Print data & graph



Excel 3 Homework #3

Cables are used to suspend bridge decks and other structures. If a heavy uniform cable hangs suspended from its two endpoints, it takes the shape of a catenary curve whose equation is

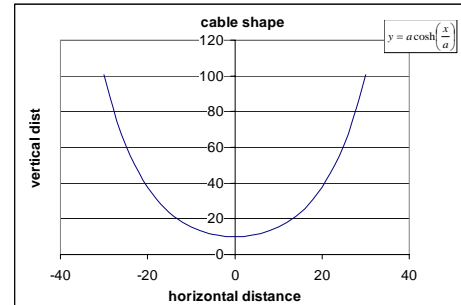
$$y = a \cdot \cosh\left(\frac{x}{a}\right)$$

where a is the height of the lowest point on the chain above some horizontal reference line, x is the horizontal coordinate in reference to this lowest point, and y is the vertical coordinate.

Use cell \$ \$ reference for the different values of a . Use Excel to create the plot for $-30 \leq x \leq 30$ when $a = 10, 15,$ and 25 . (sample answers for $a = 10$ & $a = 25$ are provided) PROVIDE DATA AND THE 3 GRAPHS

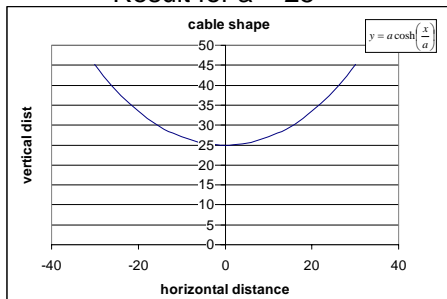
Expected Results homework #3

Result for $a = 10$



Expected Results homework #3

Result for $a = 25$



BONUS to Excel 3

Engineers often work with processes that exhibit oscillatory behavior. Mathematically, these are described by equations that contain sine or cosine functions. Create an Excel worksheet for plotting

$$y(t) = A \sin(2\omega t) + r(n)$$

where A is the amplitude of the function (a constant), ω is a constant that determines the frequency of the oscillations, and $r(n)$ is a random number between 0 and n , included to simulate "noise" that is often observed in real systems. Your worksheet should allow the user to input values of A , ω , and n and observe the resulting scatter plot of $y(t)$ vs. t , for a range of t values from 0 to 20. Submit a hard copy of a graph with $A = 4$, $\omega = 0.5$, and $n = 2.5$. Also submit a copy of the worksheet and a copy of the formulas printed in the cells.

